



## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of :  
Eiji OKABE et al. : Group Art Unit: 1756  
Serial No.: 10/726,653 :  
Filed: December 4, 2003 : Examiner: Shean C. Wu  
For: LIQUID CRYSTAL COMPOSITION AND LIQUID CRYSTAL DISPLAY  
ELEMENT

DECLARATION UNDER 37 C.F.R. § 1.132

Honorable Commissioner of Patents and Trademarks  
Washington, D.C. 20231

Sir:

I, Yoshitaka Tomi of 2-17, Tatsumidaihigashi,  
Ichihara, Chiba, Japan, declare:

That I finished the study on engineering research in a  
master course of Toyohashi Institute of Technology in March  
1991;

That I have been employed by CHISSO CORPORATION of  
Kitaku, Osaka, Japan, the Assignee of the above-identified  
U.S. patent application since April 1991, and I have been  
engaged in research and development on liquid crystal  
materials, mainly on liquid crystal compositions from April  
1991 up to now;

That I am a joint inventor of the invention disclosed  
in the above-identified U.S. patent application, and hence,  
I am fully familiar therewith; and

That in order to show distinction between the claimed

subject matter and the reference (US'938) cited in the examination of the above-identified U.S. patent application, a comparative experiment was conducted under my supervision as follows.

### 1. Comparative Experiment

A comparative experiment was conducted according to the procedure described in the present application.

Lower limit temperature of a nematic phase ( $T_c$ ) and voltage holding ratio on a thermally aged element (VHR-2) were measured on the liquid crystal compositions in Examples 9 and 16 of the reference.

By obtaining the above data in addition to the data already disclosed in the specification of the present application and the reference, the following Table was completed.

Table Comparison of physical properties between the present invention and the reference

	Reference			Present Invention
	Ex.9	Ex.16	Ex.18	
NI (°C)	87.0	70.5	79.8	85.2-91.9
$T_c$ (°C)	$-20 > T_c \geq -30$	$-20 > T_c \geq -30$	$-20 > T_c \geq -30$	$-30 > T_c \geq -40$
$V_{th}$ (V)	1.91	1.32	1.28	1.29-1.83
VHR-2 (%)	85.3*	83.7*	84.9	93.1-93.9

The data marked by \* are those obtained by the present experiments. Ex. 18 in the reference corresponds to Comparative Example 2 in the present invention.

### 2. Discussion

According to the above results, the compositions of the reference are higher in lower limit temperature of a nematic phase, and are lower or nearly lower limit of those in the present invention in higher limit temperature of a nematic phase. Accordingly, the compositions of the

present invention have a broader temperature nematic range than those of the reference.

In addition, the compositions of the present invention have a higher VHR-2 than those of the reference.

Accordingly, it is evident that the compositions of the present invention are superior to those of the reference in nematic range and VHR-2.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

This 30 day of September 28, 2004

Yoshitaka Tomi  
Yoshitaka Tomi